

## CLAIMS

1. A method for controlling the rates of concurrent digital transmissions using at least first and second queues having a plurality of locations, said method comprising the steps of:

5       for each transmission of high priority, writing an index corresponding to a data  
cell of the high-priority transmission at one of the locations in the first queue;

writing in the same way into the second queue indexes corresponding to transmissions of lower priority;

successively surveying the locations of the first queue at a rate corresponding to a  
10 cell transmission rate;

if the surveyed location in the first queue contains an index, transmitting the corresponding data cell, freeing the location, and rewriting the index at the location in the first queue that is distant from the surveyed location in the first queue by a value determined by the rate of the corresponding transmission;

15 successively surveying the locations of the second queue; and

if the surveyed location in the second queue contains an index, transmitting the corresponding data cell when the surveyed location in the first queue does not contain an index, freeing the surveyed location in the second queue and rewriting the index at the location in the second queue that is distant from said surveyed location in the second queue by a value determined by the rate of the corresponding transmission.

2. The method of claim 1, further comprising the steps of:

interrupting the surveying of the first queue when the number of indexes in the first queue reaches a predetermined limit; and

25 resuming the surveying of the first queue when a rate pointer is incremented.

3. The method of claim 2, further comprising the steps of:

writing a ghost index into at least one of the locations in the first queue; and

if the surveyed location in the first queue contains a ghost index, freeing the  
30 location and rewriting the ghost index at one of the locations in the first queue.

4. The method of claim 2, further comprising the steps of:

counting the number of transmissions of each type corresponding to the indexes

written in the first and second queues; and

if the number of transmissions of a given type reaches a predetermined limit, forbidding creation of a new transmission of that type.

- 5           5.       The method of claim 1, further comprising the steps of:  
writing a ghost index into at least one of the locations in the first queue; and  
if the surveyed location in the first queue contains a ghost index, freeing the  
location and rewriting the ghost index at one of the locations in the first queue.

- 10           6.       The method of claim 5, wherein the ghost index is rewritten at a random distance from the surveyed location.

7.       The method of claim 1, further comprising the steps of:  
counting the number of transmissions of each type corresponding to the indexes  
15 written in the first queue; and  
if the number of transmissions of a given type reaches a predetermined limit,  
forbidding creation of a new transmission of that type.

8.       A method for controlling the rates of concurrent digital transmissions  
20 using at least first and second queues having a plurality of locations, said method comprising the steps of:

for each transmission, writing an index corresponding to a data cell of the transmission at one of the locations in the first queue and/or the second queue;  
successively surveying the locations of the first queue at a higher rate than a cell  
25 transmission rate;

successively surveying the locations of the second queue;  
if the surveyed location in the first queue contains an index, transmitting the corresponding data cell, freeing the surveyed location, and rewriting the index at the location in the first queue that is distant from the surveyed location by a predetermined value;

30 interrupting the surveying of the first queue when the location indicated by a rate pointer is reached; and

incrementing the rate pointer by N locations at the transmission rate of N cells.

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9. The method of claim 8, further comprising the step of if the surveyed location in the second queue contains an index, transmitting the corresponding data cell when the surveyed location in the first queue does not contain an index or when the surveying of the first queue is interrupted.

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10. The method of claim <sup>8</sup>9, further comprising the step of writing into the first queue indexes corresponding to high priority transmissions and writing into a second queue indexes corresponding to lower priority transmissions.

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11. A machine-readable medium encoded with a program for controlling the rates of concurrent digital transmissions using at least first and second queues having a plurality of locations, said program containing instructions for performing the steps of:

for each transmission of high priority, writing an index corresponding to a data cell of the high-priority transmission at one of the locations in the first queue;

15 writing in the same way into the second queue indexes corresponding to transmissions of lower priority;

successively surveying the locations of the first queue at a rate corresponding to a cell transmission rate;

20 if the surveyed location in the first queue contains an index, transmitting the corresponding data cell, freeing the location, and rewriting the index at the location in the first queue that is distant from the surveyed location in the first queue by a value determined by the rate of the corresponding transmission;

successively surveying the locations of the second queue; and

25 if the surveyed location in the second queue contains an index, transmitting the corresponding data cell when the surveyed location in the first queue does not contain an index, freeing the surveyed location in the second queue and rewriting the index at the location in the second queue that is distant from said surveyed location in the second queue by a value determined by the rate of the corresponding transmission.

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12. The machine-readable medium of claim 11, wherein said program further contains instructions for performing the steps of:

interrupting the surveying of the first queue when the number of indexes in the first queue reaches a predetermined limit; and

resuming the surveying of the first queue when a rate pointer is incremented.

13. The machine-readable medium of claim 12, wherein said program further contains instructions for performing the steps of:

- 5 writing a ghost index into at least one of the locations in the first queue; and  
if the surveyed location in the first queue contains a ghost index, freeing the  
location and rewriting the ghost index at one of the locations in the first queue.

14. The machine-readable medium of claim 11, wherein said program further  
10 contains instructions for performing the steps of:

- writing a ghost index into at least one of the locations in the first queue; and  
if the surveyed location in the first queue contains a ghost index, freeing the  
location and rewriting the ghost index at one of the locations in the first queue.

15. The machine-readable medium of claim 11, wherein said program further  
contains instructions for performing the steps of:

- counting the number of transmissions of each type corresponding to the indexes  
written in the first queue; and  
if the number of transmissions of a given type reaches a predetermined limit,  
20 forbidding creation of a new transmission of that type.

16. A machine-readable medium encoded with a program for controlling the  
rates of concurrent digital transmissions using at least first and second queues having a  
plurality of locations, said program containing instructions for performing the steps of:

- 25 for each transmission, writing an index corresponding to a data cell of the  
transmission at one of the locations in the first queue and/or the second queue;

successively surveying the locations of the first queue at a higher rate than a cell  
transmission rate;

successively surveying the locations of the second queue;

- 30 if the surveyed location in the first queue contains an index, transmitting the  
corresponding data cell, freeing the surveyed location, and rewriting the index at the location in  
the first queue that is distant from the surveyed location by a predetermined value;

interrupting the surveying of the first queue when the location indicated by a rate

pointer is reached; and

incrementing the rate pointer by N locations at the transmission rate of N cells.

17. The machine-readable medium of claim 16, wherein said program further  
5 contains instructions for performing the step of if the surveyed location in the second  
queue contains an index, transmitting the corresponding data cell when the surveyed  
location in the first queue does not contain an index or when the surveying of the first  
queue is interrupted.

10            18.     The machine-readable medium of claim 16, wherein said program further contains instructions for performing the step of writing into the first queue indexes corresponding to high priority transmissions and writing into a second queue indexes corresponding to lower priority transmissions.

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